



Do Laboratory Based Methods to Identify Causes of Toxicity in Sediments (Toxicity Identification and Evaluation (TIE)) Really Reflect Field Conditions?

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The Problem

- Methods to Identify Toxicants in Sediments (Toxicity Identification and Evaluation (TIE)) have been developed and soon will be promulgated in an EPA Guidance Document (TIEs)
- These methods are effective in the laboratory, but do they really reflect field conditions?
- Documentation on the validity of these lab methods to reflect field conditions is critical if these methods are to be established.

Products

- Report to RMI/BAC committee
- Presentation at RMI/BAC meeting
- Presentation at International SETAC meeting
- Peer reviewed journal article in prep.

Overall Conclusion:

- Evidence indicates PAHs, the toxicant identified by the laboratory TIE is also the toxicant causing field effects. This gives us confidence that laboratory based TIE methods are a good predictor of the cause of toxicity in the field.

Project Objective:

- Perform field validation of these laboratory based methods that identify toxicants in sediments.

Findings:

- 1) Identified organic toxicants from Elizabeth River, VA (ER); suspected PAHs
- 2) Found evidence of field impacts using the Comet Assay (DNA damage) in the clam *Mercenaria mercenaria* that was field exposed in ER. Comet assay is sensitive to both PAHs and PCBs
- 3) High body burdens of PAHs (and not PCBs) in clams field exposed in ER.
- 4) Elizabeth River sediment extracts behave mechanistically like PAHs and not PCBs in EROD and deformity assays.
- 5) Evidence of photo-toxicity in clams exposed to PAH sediments. Phototoxicity is characteristic only of PAH toxicity

Project Approach:

- 1) Identify causative agent
- 2) Evidence of field impact from same toxicants identified in the laboratory.
- 3) Additional supporting evidence.

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